



# GAUSS

“Galileo Applications and Users in the  
domain of **Safety & Security**”

Hannover – 22th of June - 2006

Dipl.-Ing. Harry Evers – Managing Director - GZVB e.V.



# Location: Research Airport

**A cluster at the “Research Airport Braunschweig” that consists of public institutions like the German Aerospace Center and the General Aviation Authority, Institutes of the Technical University of Braunschweig and small and medium enterprises.**



## Information about Niedersachsen

Area:	47.515 km <sup>2</sup> , second largest German state
Population:	7.859.000
Working Population:	3.450.000
Biggest Towns:	Hannover (520.000) Braunschweig (248.000) Osnabrück (166.000)
GDP:	170.000.000.000

**The Gesamtzentrum für Verkehr Braunschweig (GZVB) offers services in the divisions Mobility and GNSS (Global Navigation Satellite System) :**

- Traffic telematics
- Traffic management
- Symposia
- Cluster network
- Project coordination



- “Landesinitiative SatNav”  
Project “GAUSS”
- Galileo networking
- Certification projects
- GNSS events
- Safety critical applications



## Galileo Applications and Users in the domain of Safety & Security (GAUSS)

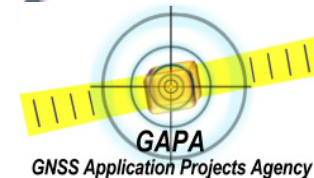


- ▶ Start of the project: 01.02.2006
- ▶ A new division of the GZVB e.V.
- ▶ Promotion as a project in the “Niedersächsische Landesinitiative SatNav”
- ▶ First members have already joined – there are further 50 LOIs
- ▶ First technical projects started
- ▶ Awaiting selection of Galileo concessionaire to initiate accreditation

# Foundation members

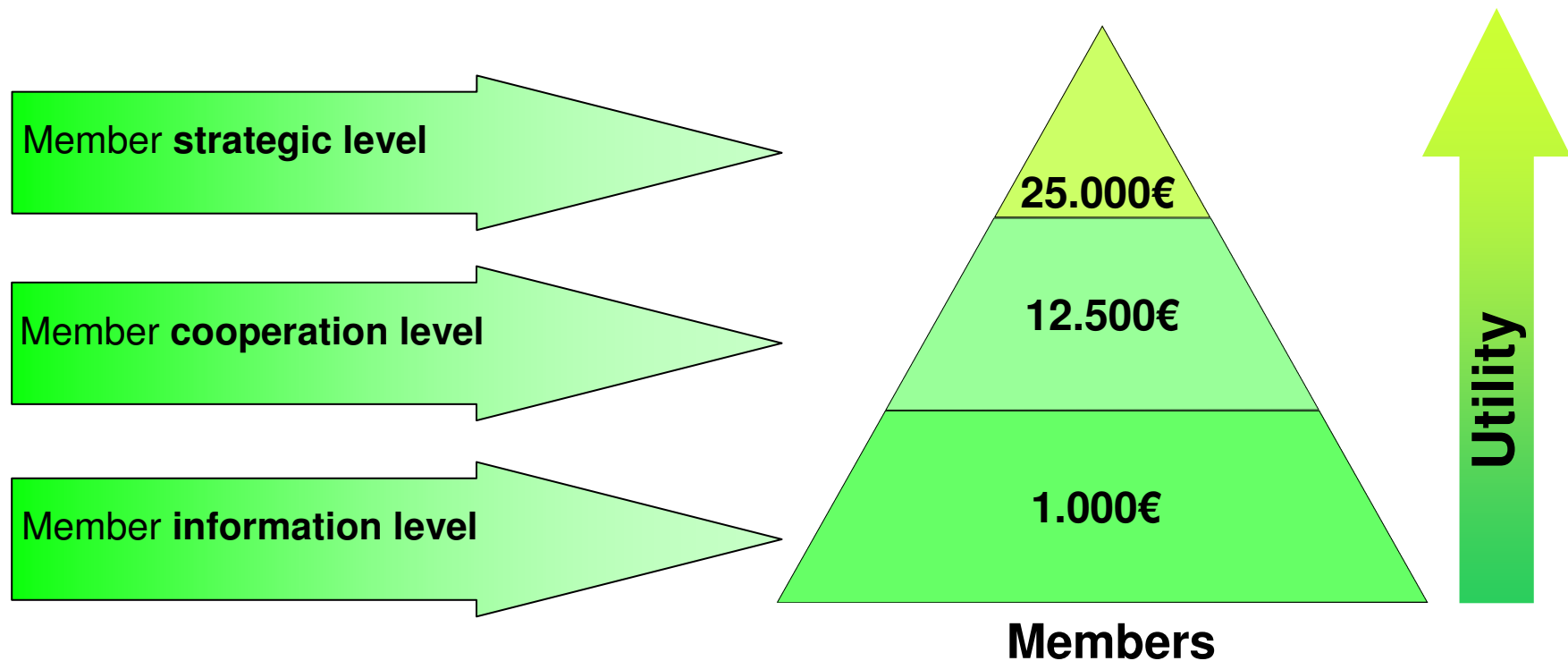
Following enterprises have a premium membership for 1 year:

- ▶ Aerodata AG
- ▶ The German Aerospace Center (DLR)
- ▶ eta\_max space GmbH
- ▶ GNSS Application Projects Agency (GAPA)
- ▶ Institute of Flight Guidance and Control of TU Braunschweig
- ▶ OECON GmbH



# Utility and Engagement

- ▶ There are three levels of membership according to engagement
- ▶ The engagement determines utility and participation



## Premium members:

- ▶ Gedas/T-Systems
- ▶ TÜV SÜD
- ▶ TÜV NORD

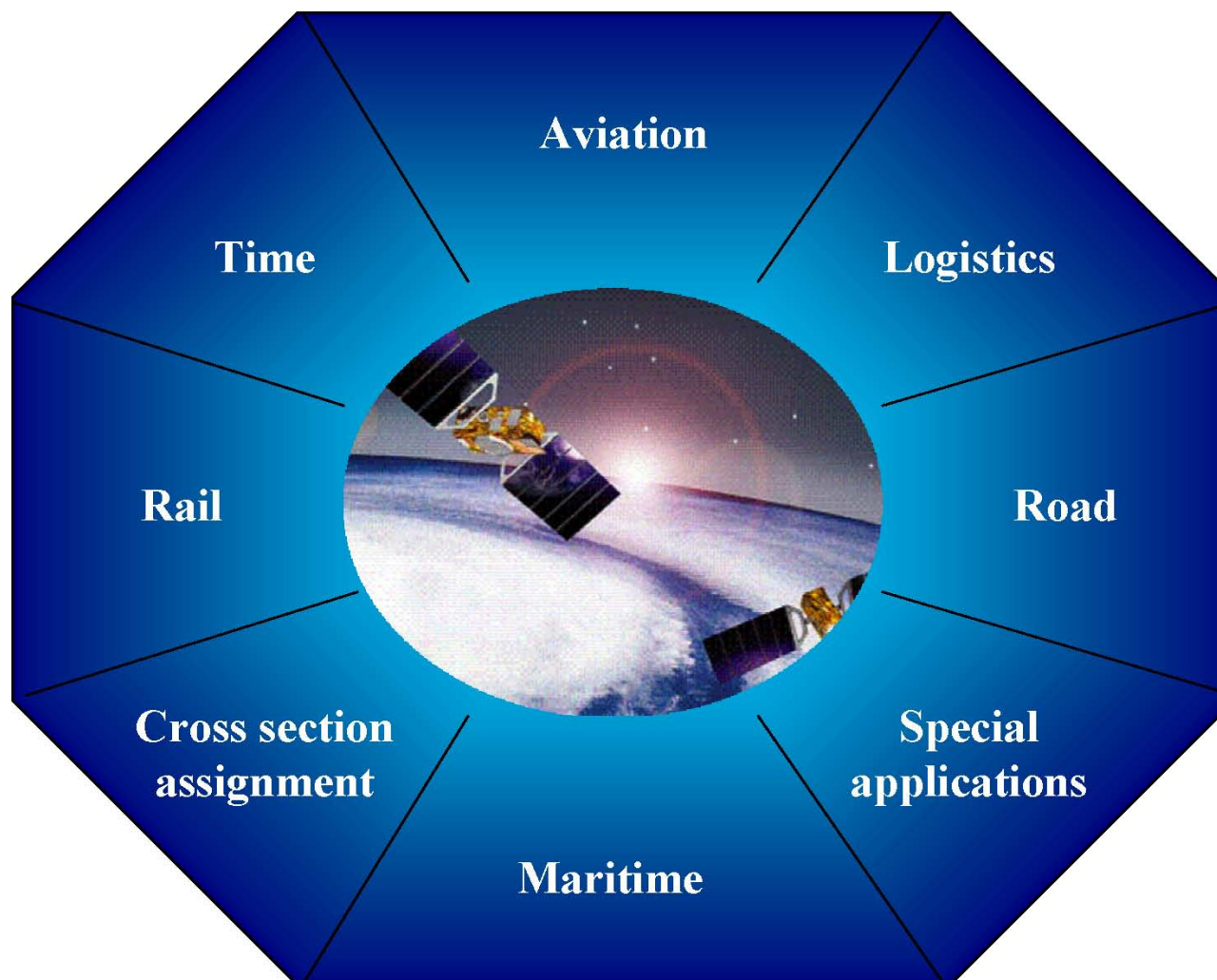


## In Cooperation with:

- ▶ Landesinitiative Telematik Niedersachsen
- ▶ Physikalisch-Technische Bundesanstalt (PTB)
- ▶ The Technical University of Braunschweig
- ▶ Deutsche Messe AG – CeBIT, BITKOM, LICON
- ▶ and other industries



# Fields of certification





## ► Certification

- Consulting
- Test execution
- Grant Certificate and Permit

## ► Knowledge Center

- Training
- Seminars & Conferences
- Product-based consulting

## ► Studies

- Feasibility Studies
- Market Analysis

## ► Technology Management

- Facilitate partnerships
- Project management for R&D
- Broker R&D resources
- Provide standardized hardware & software modules for safety-critical applications

## ► Simulation

- Hardware/Software Simulation
- Qualify Algorithms



# Activities

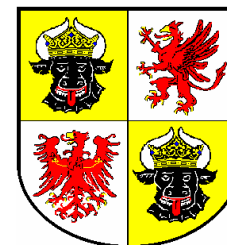
## Conferences and Presentations

- ▶ ITS Presentation in Brussels (January 2005)
- ▶ Parliamentary evening in Berlin (February 2005)
- ▶ Munich Satellite Navigation Summit (March 2005)
- ▶ CERGAL in Braunschweig (April 2005)
- ▶ International ITS Congress in Hanover (June 2005)
- ▶ World ITS Congress in San Francisco (October 2005)
- ▶ Munich Satellite Summit ( February 2006)
- ▶ CeBIT 2006 Hanover (March 2006)
- ▶ CERGAL in Braunschweig (April 2006)
- ▶ EURISY Conference Prague (April 2006)



# National cooperation Galileo

- ▶ **Cooperation between Bavaria, Mecklenburg-Vorpommern and Niedersachsen**
  - ▶ **Project partners: BayNavTech, GATE, GAMMA**
  - ▶ **Industry partners: Siemens, TÜV SÜD**
  - ▶ **GAUSS has the mandate for Niedersachsen**
- 
- ▶ **First cooperative project started in May 2006**



# Target applications

**Positive  
train  
control**



**Aviation  
Terminal Area  
and Approach  
Guidance**



**Harbor  
entry  
Automated  
docking**



**Transport of  
Hazardous  
Material by Rail  
or Truck**



**Autonomous  
Vehicles**

**Professional timing and synchronization services**



## Top Level Requirements

**Provide basis for integration and verification of Galileo system**

**Coordinate between subsystems i.e. GMS, GCs, SS AIV**

**Provide clear approach for end-to-end functional and performance verification**

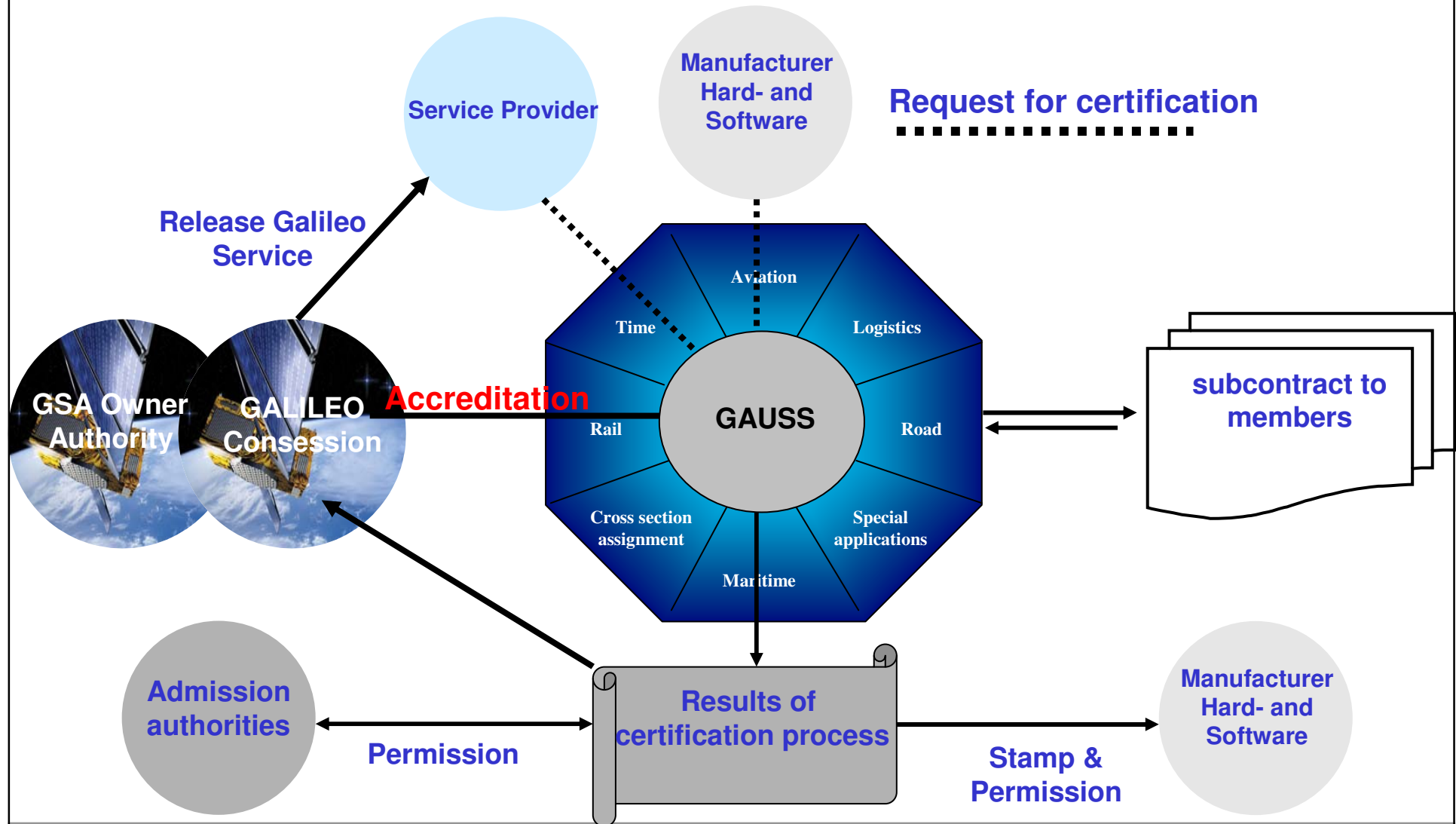
**>>> Deliver Certifiable System i.e.**

**>>> Fault Free SIS <<<**

# Structure and process of certification



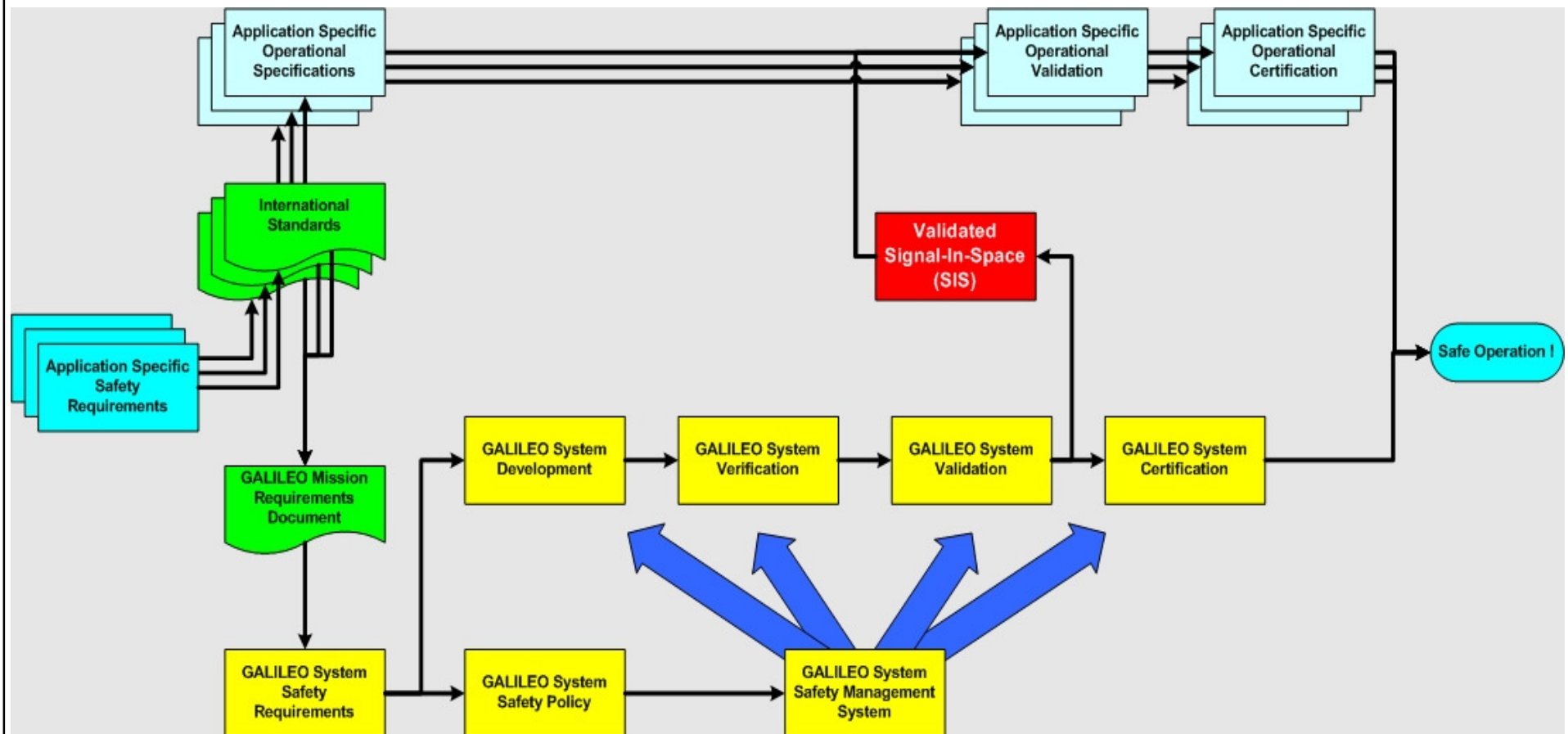
Niedersachsen: SatNav





# Safety Case Methodology

## How does it work?!



## Major Process Steps:

- Functional Hazard Assessment (FHA)
- Preliminary System Safety Assessment (PSSA)
- System Safety Assessment (SSA) including Fault Tree Analysis (FTA), Failure Mode Effects Analysis (FMEA), Common Cause Analysis (CCA)

## Assessment Types:

- Technical Assessment (Equipment, Segment, System Level) >>> Type Approval >>> Certification
- Operational Assessment (Application Level)  
>>> Operational Approval >>> Certification

# Certification Stakeholders



Niedersachsen: **SatNav**

**General:** ISO, ITU, IEC, CENELEC, ETSI, ECCS, National Authorities e.g. FCC, DIN, etc.

**Aviation:** ICAO, EASA, EUROCONTROL, FAA, EUROCAE, RTCA, National CAAs, etc.

**Maritime:** IMO, IALA, IHO, RTCM, National MoTs, etc.

**Rail:** UIC, ERRI, National MoTs and Railway Services

**Land Transport:** ERTICO, National MoTs, National Authorities, (TÜV, DEKRA, etc.)

**Personal Mobility:** CGALIS, EC (E112-Regulation), US (E911-Regulation), COSPAS-SARSAT, Mountain Rescue, Red Cross, etc.

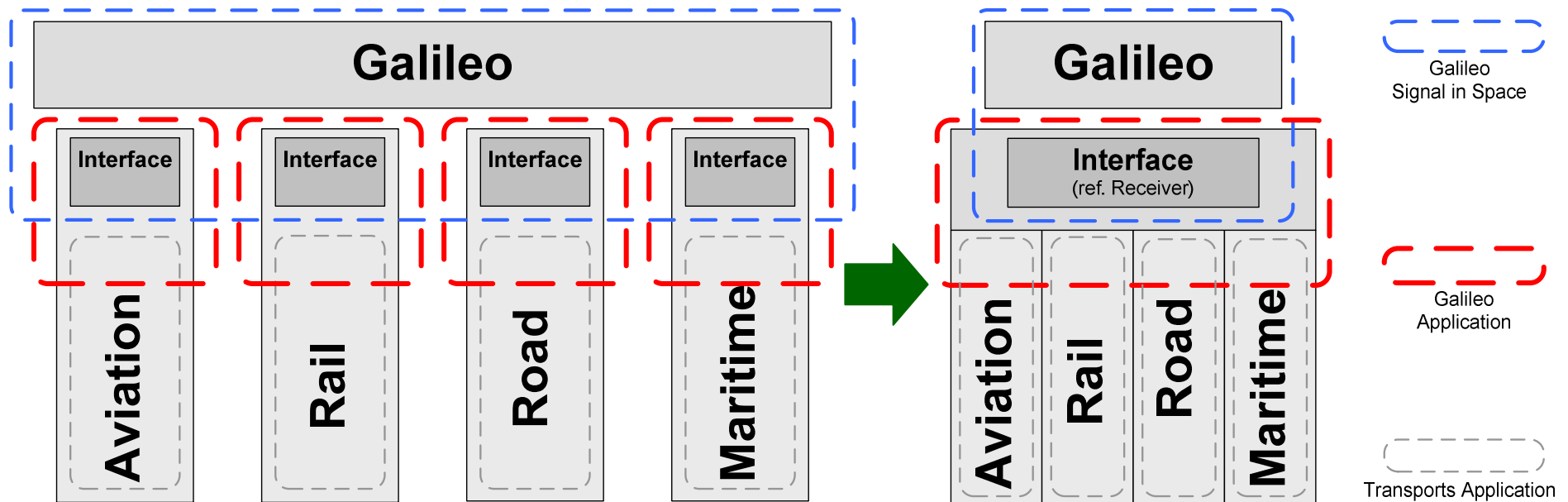


Premium Members:



# Type Approval and Certification

## From application specific to multimodal approval



### Multimodal approach:

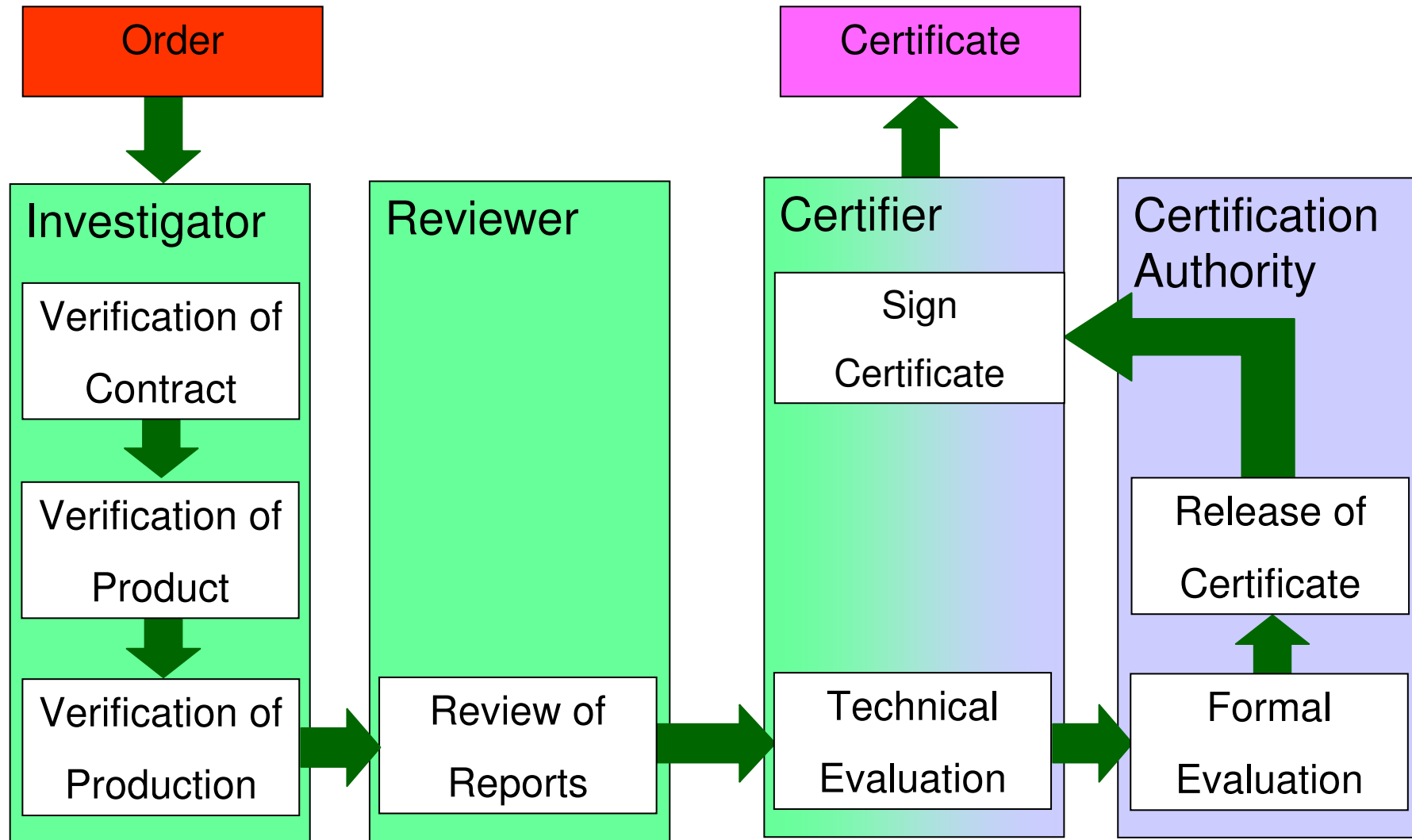
- reduces redundant analysis and testing
- broadens the market for service providers and manufacturers

# GAUSS Objectives



1. Certification procedures for safety critical applications of satellite services in a certification order
2. Formulation of harmonized test procedures
3. Formulation of diagnostic programs
4. Know-how of the technical and formal evaluation and review of the accomplished tests
5. Development of a certification authority employing interdisciplinary professional certifiers
6. Accrediting of the certification authority with the relevant attestors
7. Development of a public certification data base including search functions for products, services and provider of the certified services

# From Order to Certificate





# Types of certificates

## Quality Management System

ISO/IEC 9000 Standards

**Certifies implementation of good industrial practice**

Organization, procedures, ...

## Electromagnetic Compatibility

EU/EC Regulations



**Certifies that product does not interfere with other equipment**

Product and design specific

## Product Safety

ISO/IEC 17000 Standards

**Certifies that product can be safely used by persons**

Product and design specific

## Product Functionality

Application / user specific functional standards

**Certifies that product can be used for a specific function**

Product and design specific

## Product Reliability, Integrity

Application / user specific reliability / integrity standards

**Certifies that product can be used for safety-of-life applications**

Product and design specific

## Certificate

No.: Z1 01 17 99999 123

Sample Corporation

111 Sample Street  
Nowhere, XX 88888  
USA



with the production facility(ies)  
AAAAA BBBB CCCCC

is authorized to label the following product with the  
"TUV Mark"  
concerning the enclosed attachment. See also notes overleaf.

Product: Control units  
Fibre Channel Switch

Model: AB-1234

Parameter:

Rated Input Voltage:	100-230 V AC
Rated Frequency:	50-60 Hz
Rated Input Current:	4.0 – 2.0 A
Protection Class:	
Degree of Protection (IP):	Ordinary

The compliance of the above-mentioned product with the following essential requirements voluntary basis:

EN 60950/A11: 1997

Report No.: CC123456789

Released with the above certificate number by the  
Certification Body of TUV PRODUCT SERVICE INC.

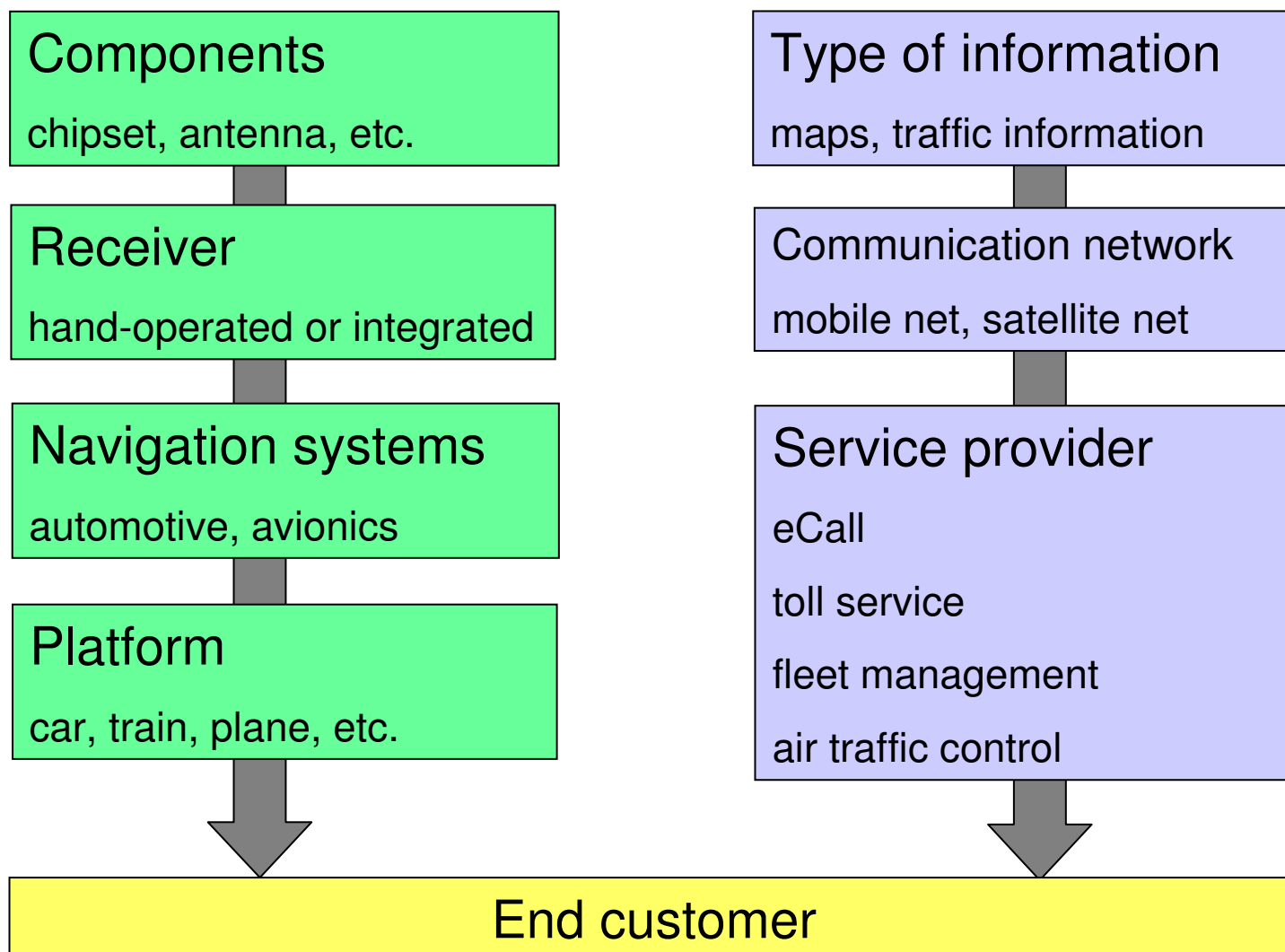
MH – (Z1 01 01 99999 123)  
R – (Z1 01 01 99999 123)

Department: USAMIC/ AA  
Date: 01-01-01

# Test and certification objects



Niedersachsen: SatNav



# Panel discussion CeBIT 2006





# CeBIT 2007

 **Innovation**  
Niedersachsen: **SatNav**

**GAUSS will become organizer of the satellite navigation activities at the CeBIT 2007 and will offer enterprises and partners a wide international forum.**



**CeBIT**  
Join the vision

**HANNOVER  
GERMANY**  
**15–21 MARCH 2007**

**[cebit.com](http://cebit.com)**



**Premium Members:**





# Thank you for your attention

